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ON THE WAY TO MARS

By

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ON THE WAY TO MARS

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ON THE WAY TO MARS

In November of 1962 in the Soviet Union there was accomplished the launching of the interplanetary station Mars 1 on its way to Mars itself. This new success of Soviet science and technology considerably increases the possibility of man's knowing about outer space and the planets of the solar system.

Thanks to the launching of the artificial satellites it has been established that the earth is surrounded by several radiation belts consisting of particles captured by its magnetic field. This discovered knowledge constitutes in principle a new fact.

Among other problems connected with the study of outer space one affording much interest is the study of the energy spectra of the fluxes of corpuscular radiation of the sun and interplanetary plasma. Particularly, if Mars possesses a magnetic field, then it is surrounded, just as the earth is, by a radiation belt.

In piercing the depths of outer space it is important to know what the density of meteoric substance is. This has not only scientific, but also practical significance for future astronauts.

In order for an interplanetary station to fly sufficiently close to Mars it is necessary to assure an extremely high degree of precision in launching a space rocket on its computed trajectory. Thus errors in the speed of the space rocket of not more than 30 centimeters per second or errors in the direction of its flight of one angular minute lead to an increase in its distance from Mars of 20 thousand kilometers.

A computation of the movement of the station Mars 1 by the data of the trajectory measurements shows that it is passing at a distance of 193 thousand kilometers from Mars. This is evidence of high precision in getting

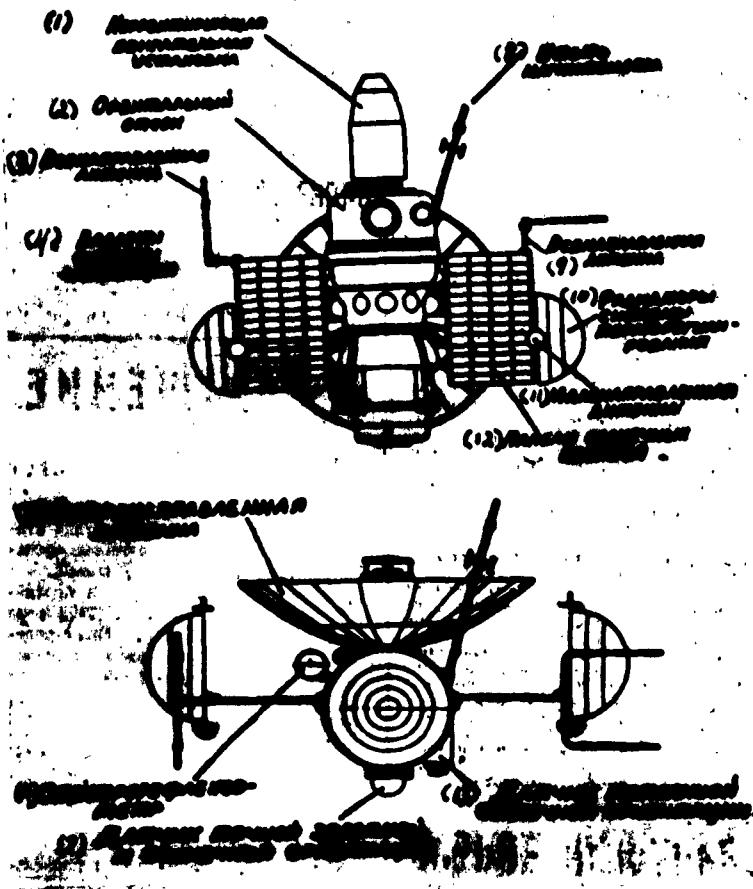


Diagram of the design of the station

Key: (1) correcting motive unit; (2) orbital compartment; (3) all-directional antenna; (4) balloons of orientation system; (5) precision-directional antenna; (6) spectroreflexometer; (7) pickup of precise stellar and solar orientation; (8) magnetometer post; (9) all-directional antenna; (10) radiators of heat regulation system; (11) slightly directional antenna; (12) panels of solar batteries; (13) pickup of constant solar orientation.

the station onto its assigned trajectory. In order to assure the flight of the station to a nearer approach to the surface of Mars correcting of its trajectory has to be done.

A word about how the interplanetary station Mars 1 is arranged. It consists of two hermetically concealed compartments: the orbital and the planetary. In the orbital there are arranged the apparatuses which assure the working of the station during the time of its flight to Mars. In the planetary there are the scientific instruments which function at the planet.

The greatest dimensions of the station are: 3,300 mm in length, 1,100 mm in diameter for the orbital

compartment, and 4,000 mm in width taking into account the solar batteries and radiators.

The weight of the station is 893.5 kg. It is provided with technical radio equipment, a system of orientation and correction of the trajectory, and sources of power supply. For carrying on scientific investigation there are scientific apparatuses on the station.

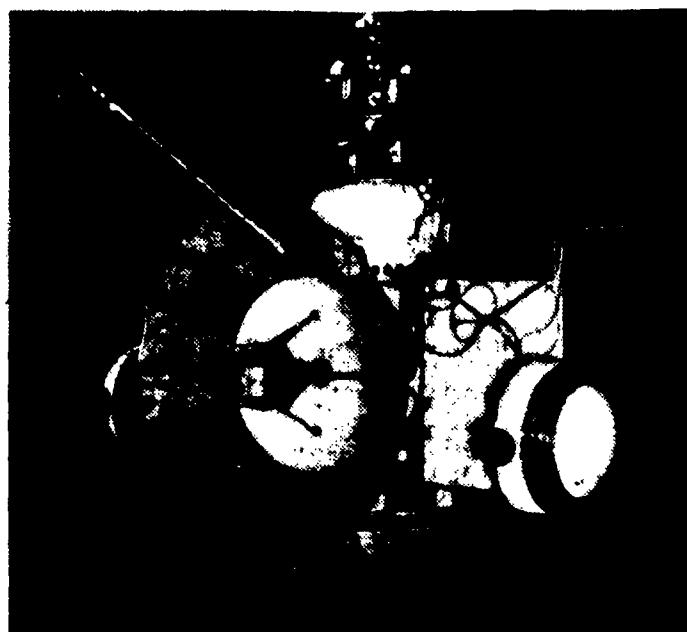
SEE PAGE 3a FOR PICTURE
Automatic interplanetary station Mars 1 on mounting base (side view)

The periods of communication with the station, which occur both automatically and

on command from the earth, give evidence of normal operation of all the systems aboard the station.

At the times of these periods there have been received data about the interplanetary medium, radiations, and fields in outer space, from distances up to six to eight million kilometers from the earth. Close to the earth and from the outer space around the earth there have been received new data about the distribution of charged particles and the so-called geocorona, a plasma envelope of the earth, and there have been recorded flows of corpuscles coming from the sun.

Measurements have been made of the intensity of the radiation in the region of the radiation belts of the earth, and also of the intensity during a period of cosmic radiation at deep penetration into outer space. It turned



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out that since the time of the flight of the Soviet lunar space rockets the intensity of the background of cosmic radiation has increased 50 to 70 per cent. This is connected apparently with the fact that the observations were made in another period of solar activity. Far from the earth there have been observed variations--changes--of the magnetic field of the order of 4 to 12 gammas.. At the time of the flight of the station in the outer space near the earth there were recorded frequent collisions with micro meteors. After passing on to considerable distance the number of collisions sharply diminished.

In the Saturday number of the Pravda there was published detailed information about the flight of the station Mars 1.

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